PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference	**FOR FURTHER ACTION**
see form PCT/ISA/220	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP2004/012736	10.11.2004	10.11.2003

International Patent Classification (IPC) or both national classification and IPC
G06F17/50, G06F11/36

Applicant
ROBERT BOSCH GMBH

1. This opinion contains indications relating to the following items:

   ☒ Box No. I   Basis of the opinion

   ☐ Box No. II   Priority

   ☐ Box No. III   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   ☐ Box No. IV   Lack of unity of invention

   ☒ Box No. V   Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   ☐ Box No. VI   Certain documents cited

   ☐ Box No. VII   Certain defects in the international application

   ☒ Box No. VIII   Certain observations on the international application

2. **FURTHER ACTION**

   If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

   If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

   For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Alonso Nogueiro, L Telephone No. +49 89 2399-7999

Box No. I   Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐   This opinion has been established on the basis of a translation from the original language into the following language   , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐   a sequence listing

   ☐   table(s) related to the sequence listing

   b. format of material:

   ☐   in written format

   ☐   in computer readable form

   c. time of filing/furnishing:

   ☐   contained in the international application as filed.

   ☐   filed together with the international application in computer readable form.

   ☐   furnished subsequently to this Authority for the purposes of search.

3. ☐   In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. V   Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-4,6,7,9,10,12-15
Inventive step (IS)	Yes:	Claims	
	No:	Claims	5,8,11
Industrial applicability (IA)	Yes:	Claims	1-15
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VIII   Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V
Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.   Reference is made to the following documents:

D1:   SEUNGWOO SON ET AL: "Debugging protocol for remote cross development environment" PROCEEDINGS SEVENTH INTERNATIONAL CONFERENCE ON REAL-TIME COMPUTING SYSTEMS AND APPLICATIONS IEEE COMPUT. SOC LOS ALAMITOS, CA, USA, 2000, pages 394-398, XP002343765 ISBN: 0-7695-0930-4

D2:   HASSANI M ET AL: "A mechanism for communicating in dynamically reconfigurable embedded systems" HIGH-ASSURANCE SYSTEMS ENGINEERING WORKSHOP, 1997., PROCEEDINGS WASHINGTON, DC, USA 11-12 AUG. 1997, LOS ALAMITOS, CA, USA,IEEE COMPUT. SOC, US, 11 August 1997 (1997-08-11), pages 215-220, XP010265252 ISBN: 0-8186-7971-9

2.   The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 12, 13, 14 and 15 is not new in the sense of Article 33(2) PCT.

2.1   The document D1 discloses (the references in parentheses applying to this document):

a) A simulation system for computer-implemented simulation and verification: figures 2 and 4; 'debugging protocol for debbuging...' page 394, right column.

b) of a control system under development: '...for debugging embedded real-time applications' page 394, right column; figure 2. The control system is the SW running on the target, it comprises the embedded real-time application, the RTOS and the Target Agent/Target Shell.

c) a host-target architecture: figures 2 and 4; page 395, left column.

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d) an operating system of the target representing at least a part of the control system: figure 2; page 397, left column. The control system is the SW running on the target, it comprises the embedded real-time application, the RTOS and the Target Agent/Target Shell.

e) reconfigured by the host via a application programming interface dedicated to the operating system of the target: figure 3; page 397, left column. The Target Agent (TA) uses the kernel API of the RTOS. Each debugging protocol primitive is implemented by a routine which calls appropriate kernel primitives (functions). These primitives include creation, deletion, suspension and resume of tasks (processes). By creating/deleting a task (or process) the operating system is reconfigured (compare with lines 5 to 7 and 20 to 25 of page 27 of the description of the present application).

2.2   Additionally, D1 discloses a interactive shell providing interactive access from the host to all run-time facilities (on the target). From the shell, the developer can download applications (interactively) and debug tasks. Within the conventional capabilities of a shell are change of priorities, load/unload of tasks, alarms, etc. Consequently, addition of these features to claim 1 would lead to non-inventive subject-matter.

2.3   The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 12, 13, 14 and 15, which therefore are also considered not new.

3.   Dependent claims 2 to 11 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step.

Claim 2: The OS of D1 is an RTOS.

Claim 3: In D1 the real-time embedded application is downloaded to the target (see page 397, left and right columns) then the program is debugged, thereby creating/deleting tasks, i.e. reconfiguring the OS. The interactive shell is used to

access tasks, memory, timers... (accessing means reading and writing), therefore this also changes the configuration of the OS.

Claim 4: In D1 one interface of the OS is used.

Claim 5: It is a matter of choice where to locate the reconfiguration interface. It is not clear what is meant by 'instead of' since in any case the system calls of the OS will have to be called to operations like task creation.

Claim 6: The modelling tool is the remote debugger of D1.

Claim 7: The Target Server is the Target Agent of D1.

Claim 8: It is not clear what is meant by 'protocol driver'. The Target Agent of D1 contains protocol code of a communication protocol for communication with the target. The **device** drivers are usually part of the OS.

Claims 9 to 10: In D1 a plurality of processes (modules) execute a plurality of simulation models on the target. The use of memory and interface modules and the communication through memory locations are common implementation options, exemplary disclosed in D2.

Re Item VIII
Certain observations of the international application:

4.   Following points should be taken into consideration:

a) To meet the requirements of Rule 5.1(a)(ii) PCT, documents D1 and D2 should be identified in the description and the relevant background art disclosed therein should be briefly discussed.

b) Any new amended independent claims should be filed in the two-part form

required by Rule 6.3(b) PCT.

c) The application may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed Article 34(2)(b) PCT.

5. The applicant, when drawing up a new independent claim, is requested to:

a) discuss the **technical** features of such a claim not disclosed in D1 (the differences of such a claim compared to D1),

b) identify the **technical** effect provided by such technical features,

c) formulate the objective technical problem to be solved (based on the effect provided by differences to D1), i.e. how to provide the identified technical effect through modification of D1, and

d) explain why such a modification would not be obvious to the person skilled in the art taking into account the prior art.

6. In order to facilitate the examination of the conformity of the amended application with the requirements of Article 34(2)(b) PCT, the applicant is requested to clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based.

If the applicant regards it as appropriate these indications could be submitted in handwritten form on a copy of the relevant parts of the application as filed.